



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|-------------------------|------------------|
| 10/711,514 | 09/23/2004 | Chih-Chieh Yeh | 13621-US-PA | 5513 |
| 31561 | 7590 | 02/04/2005 | EXAMINER | |
| JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE | | | LE, THONG QUOC | |
| 7 FLOOR-1, NO. 100 | | | ART UNIT | PAPER NUMBER |
| ROOSEVELT ROAD, SECTION 2 | | | | |
| TAIPEI, 100 | | | 2827 | |
| TAIWAN | | | DATE MAILED: 02/04/2005 | |

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/711,514 | YEH ET AL. | |
| | Examiner | Art Unit | |
| | Thong Q. Le | 2827 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-16 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-16 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date _____
- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____
- 5) Notice of Informal Patent Application (PTO-152)
 6) Other: _____

DETAILED ACTION

1. Claims 1-16 are presented for examination.

Specification

2. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

3. Regarding claims 1-16, line 1, should be deleted [Claim #] for avoiding to use duplicate of the number of claim.

Claim Rejections - 35 USC § 112

4. Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
5. Claims 1-16 provide for the use of a method for programming a memory, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claims 1-16 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under

35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Kanamitsu et al. (U.S. Patent No. 6,078,519).

Regarding claims 1-6, Kanamitsu et al. disclose a method for programming a non-volatile memory (ABSTRACT), comprising:

selecting a reference level according to a level distribution of a plurality of memory cells in a storage state in the non-volatile memory (Column 1, lines 44-67, column 2, lines 1-10); and

programming a plurality of predetermined memory cells to a next storage state according to the reference level (Figure 8),

wherein the reference level falls between the cell level distribution of the memory cells in the current storage state and the cell level distribution of the memory cells in the next storage state (Figures 8, 18A-F), and wherein the levels of the memory cells in the next storage state are higher than the levels of the memory cells in the current storage state, and the reference level falls between a highest level of the memory cells in the

current storage state and a lowest level of the memory cells in the next storage state (Figures 18), and wherein selecting the reference level comprises: predetermining a plurality of candidate reference levels, and selecting one candidate reference level from the candidate reference levels whose levels are higher than the highest level of the memory cells in the storage state as the reference level (Figure 14), and wherein the non-volatile memory is a one-time programmable (OTP) memory, a multi-time programmable (MTP) memory, a multi-level cell (MLC) memory, or a programmable resistor with erase-less memory (PREM) (Column 1, lines 7-40), and wherein the storage state of a memory cell depends on its cell current, and the reference level is a current reference level (Column 1, lines 59-67), and wherein the storage state of a memory cell depends on its threshold voltage, and the reference level is a threshold voltage reference level (Column 14, lines 13-41).

Regarding claims 7-12, Kanamitsu et al. disclose a method for programming a multi-level cell (MLC) non-volatile memory whose memory cells having a first storage state up to an Nth storage state in an ascending order of level, the method comprising:

(a) selecting an i^{th} reference level according to a level distribution of the memory cells in an i^{th} storage state; (b) programming a plurality of memory cells to a $(i+1)^{\text{th}}$ storage state according to the i^{th} reference Level; and repeating steps (a) and (b) until programming of the Nth storage state is completed, wherein an initial value of i is 1, the value of i is incremented by 1 before each repetition, and the i^{th} reference level falls between a highest level of the memory cells in the i^{th} storage state and a lowest level of the memory cells in the $(i+1)^{\text{th}}$ storage state (Figures 8, 18, 19,20), and further

Art Unit: 2827

comprising: predetermining a plurality of candidate reference levels before steps (a) and (b); and step (a) comprising: selecting one candidate reference level from the candidate reference levels whose levels are higher than a highest level of the memory cells in the ith storage state as an ith reference level (Column 1, lines 5-58), and wherein the storage state of a memory cell depends on its threshold voltage, and the reference level is a threshold voltage reference level , and wherein the storage state of a memory cell depends on its cell current, and the reference level is a current reference level (Column 1, lines 20-35), and where MLC non- volatile memory comprises a programmable resistor with erase-less memory (PREM) (Column 1, lines 20-35).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thong Q. Le whose telephone number is 571-272-1783. The examiner can normally be reached on 8:00am-5:00pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoai V. Ho can be reached on 571-272-1777. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2827

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Thong Q. Le
Primary Examiner
Art Unit 2827

**THONG LE:
PRIMARY EXAMINER**